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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/429,262	10/29/1999	HO-JIN KWEON	03364.P021	5716

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10/27/2004

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EXAMINER

DOVE, TRACY MAE

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 10/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/429,262

Applicant(s)

KWEON ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-5,7-9,11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5,7 and 8 is/are allowed.
- 6) ☒ Claim(s) 1,3,4,9,11 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/2/04.
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date attached.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This Office Action is in response to the communication filed on 9/14/04. Applicant's arguments have been considered, but are not entirely persuasive. Claims 1, 3-5, 7-9, 11 and 12 are pending. Claims 2, 6 and 10 have been canceled.

#### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 6-10, 12-14 and 18 of U.S. Patent No. 6,783,890. Although the conflicting claims are not identical, they are not patentably distinct from each other because both require an active material component coated with a metallic oxide.

Claims 5, 7 and 8 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent No. 6,372,385. Although the conflicting claims are not identical, they are not patentably distinct from each other because both require a method of preparing a positive active material for a rechargeable lithium battery comprising coating a metallic alkoxide solution on a lithium transition metal oxide powder wherein the coated powder is heat treated to form a metal oxide coated powder.

Claims 1, 4, 5, 7-9 and 12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 4 and 6-16 of copending Application No. 10/041,921 (US2002/0061444). Although the conflicting claims are not identical, they are not patentably distinct from each other because both require an active material component coated with a metallic oxide and a method of preparing a positive active material for a rechargeable lithium battery comprising coating a metallic alkoxide solution on a lithium transition metal oxide powder wherein the coated powder is heat treated to form a metal oxide coated powder. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### ***Claim Objections***

Claim 1 is objected to because of the following informalities: the claim recites "a metal selected from the group consisting of Mg Al", which should recite "a metal selected from the group consisting of Mg and Al". Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 9, 11 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyaki et al., US 6,365,299.

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Miyaki teaches a nonaqueous secondary battery comprising a positive electrode and a negative electrode both containing a material capable of reversibly intercalating and deintercalating lithium. A protective layer is provided on the negative electrode and/or the positive electrode. See abstract. The protective layer preferably contains insulating organic or inorganic fine particles and has a thickness of 1-40  $\mu\text{m}$  (1000-40000 nm). The inorganic particles may be oxides, especially those hardly susceptible to oxidation or reduction are preferred. Examples include oxides of sodium, potassium, magnesium, calcium, strontium and aluminum.  $\text{TiO}_2$  is also useful. See col. 2, lines 40-col. 3, lines 14. The protective layer can be formed successively or simultaneously by applying an electrode material mixture onto a current collector (col. 6, lines 47-50). The surface of the oxide as a positive electrode active material can be coated with an oxide having a different chemical formula from the positive electrode active material (col. 16, lines 4-8). Examples of lithium containing metal oxide positive active materials are disclosed in col. 16, lines 26-col. 17, lines 13.

Thus the claims are anticipated.

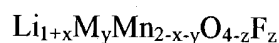
***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amatucci et al., US 5,674,645 in view of Miyasaka, US 5,869,208.

Amatucci teaches a lithium ion rechargeable battery having a lithium manganese oxy-fluoride positive electrode material. The material has the general formula:



where M is Co, Cr or Fe; and x, y and z are defined as in the abstract. See also Example 1 and Example 9.

Amatucci does not explicitly teach that the lithium manganese oxy-fluoride positive electrode material is coated with a metallic oxide.

However, Miyasaka teaches a lithium ion secondary battery having a positive electrode comprising an active material of a lithium transition metal oxide which is coated with a non-electron conductive protective layer. See abstract. The lithium transition metal oxide may have the formula  $\text{Li}_y\text{Mn}_2\text{O}_4$  wherein  $0 < y \leq 1.2$ . The non-electron conductive protective layer that coats the positive active material comprises particles of a metal oxide selected from the group consisting of aluminum oxide, titanium dioxide and zirconium oxide. See col. 3, lines 16-23 and col. 4, lines 1-4. Table 1 lists preferred compositions of the positive electrode active material. Examples of electro-insulative material include alumina (aluminum oxide), calcium oxide, titanium dioxide and magnesia (magnesium oxide). See col. 6, line 59-col. 7, line 10. The protective layer generally has a thickness of 0.5-50  $\mu\text{m}$  (500-50000 nm). See col. 7, lines 40-44.

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Miyasaka teaches the positive electrode of the lithium ion secondary battery should be coated with a non-electron conductive (or electro-insulative) protective layer so that the surface of the positive electrode can be kept from lithium metal dendrite which may be produced on the negative electrode (col. 6, lines 59-64). Thus one

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of skill would be motivated to coat the active material of Amatucci with the metal oxide of Miyasaka because any metal dendrites formed can be kept from contacting the positive electrode and creating a short circuit.

***Allowable Subject Matter***

Claims 5, 7 and 8 are allowed.

The following is an examiner's statement of reasons for allowance: the claims are directed toward a method of preparing a positive active material for rechargeable lithium batteries. The method comprises obtaining a powder, coating the powder with a metallic alkoxide solution to make an alkoxide-coated powder wherein the metallic alkoxide solution is Mg-alkoxide or Al-alkoxide. The alkoxide-coated powder is then heat-treated such that the alkoxide-coated powder is changed into a oxide-coated powder.

The prior art does not teach the method of preparing a positive active material for rechargeable lithium batteries as recited by claims 5, 7 and 8. Specifically, the prior art does not teach the alkoxide solution of the claimed invention.

Takeuchi (WO 99/05734) teaches a metallic alkoxide coated powder where the alkoxide-coated powder is converted to an metal oxide coated powder. However, Takeuchi has been removed as prior art against the claimed invention. The declaration filed on 6/2/03 under 37 CFR 1.131 has been considered and is effective to overcome the WO99/05734 and/or US6,429,766 references. The evidence submitted is sufficient to establish a conception of the invention prior to the effective date of the WO99/05734 and/or US6,429,766 references. The translation of the Korean Invention Report (dated 12/20/98) submitted in the declaration provides full support for the claimed invention (as amended on 9/14/04).

***Response to Arguments***

Nunome (EP0789410)

The 35 U.S.C. 102(b) rejection in view of Nunome has been withdrawn because claims 9, 10 and 12 require a metallic oxide comprising a metal selected from Mg and Al. Nunome does not teach the claimed powder coated with magnesium oxide or aluminum oxide. Accordingly, the 35 U.S.C. 103(a) rejection of claim 11 in view of Nunome is also withdrawn. Nunome does not teach the method of claim 5. Specifically, a metallic alkoxide-coated powder is not disclosed.

Miyaki (US6,365,299)

Applicant argues claim 9 is not anticipated by Miyaki because Miyaki does not teach that a positive electrode is formed after the active material particles are coated with metallic oxide. However, Miyaki teaches the protective layer can be formed successively or *simultaneously* by applying an electrode material mixture onto a current collector (col. 6, lines 47-50). The surface of the positive electrode material can be coated with an oxide having a different chemical formula from the positive electrode active material (col. 16, lines 4-8).

Amatucci in view of Takeuchi

The declaration under 37 CFR 1.131 establishes an invention date prior to the publication date of Takeuchi (WO99/05734). Thus, the 35 U.S.C. 103(a) rejection in view of Takeuchi is withdrawn.

Amatucci in view of Miyasaka

Applicant argues the declaration provides evidence of unexpected properties for the claimed invention over the Miyasaka reference. However, claims 1-4 do not contain the product-



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by-process limitation the "positive electrode formed after coating". Applicant states Miyasaka teaches coating an electrode with an oxide after the electrode is formed and that there is no teaching or motivation in the reference to form a positive active material of metallic oxide coated active material moieties. However, Miyasaka teaches a lithium ion secondary battery having a positive electrode comprising an active material of a lithium transition metal oxide which is coated with a non-electron conductive protective layer (see abstract).

### ***Conclusion***

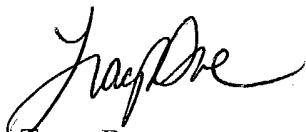
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Art Unit 1745

October 22, 2004